

CRANBERRY ISLAND HARBOR MAINE

SURVEY

(REVIEW OF REPORTS)

*Site of the point of the D.C.E.
800.92 (Cranberry Island, Me.) - 15-*



CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION, BOSTON, MASS.

APRIL 27, 1951

TABLE OF CONTENTS

<u>PARAGRAPH NO.</u>	<u>SUBJECT</u>	<u>PAGE NO.</u>
1	Syllabus	ii
1	Authority	1
3	Reports under Review	1
4	Description	2
6	Tributary Area	3
8	Bridges	3
9	Prior Reports	3
10	Existing Corps of Engineers Project and Other Improvements	4
11	Terminal and Transfer Facilities	4
15	Improvement Desired	5
25	Commerce	8
26	Vessel Traffic	8
27	Difficulties Attending Navigation	9
30	Water Power and Other Special Subjects	10
31	Plan of Improvement	10
34	Aids to Navigation	11
35	Shore Line Changes	11
36	Estimates of First Cost	12
37	Estimates of Annual Charges	13
38	Estimates of Benefits	14
50	Comparison of Benefits and Costs	19
51	Allocation of Costs and Local Cooperation	19
52	Coordination with Other Agencies	20
53	Discussion	20
64	Conclusions	24
67	Recommendations	25

NOT FOR PUBLIC RELEASESURVEY
(REVIEW OF REPORTS)

OF

CRANBERRY ISLAND HARBOR, MAINE

SYLLABUS

The Division Engineer finds that prospective benefits are insufficient to warrant improvement of Cranberry Island Harbor, Maine, by dredging a channel 100 feet wide and 6 feet deep into the deep area of the Pool and a similar branch channel to a proposed town wharf. He, therefore, recommends that no project for Cranberry Island Harbor be adopted at this time.

NOT FOR PUBLIC RELEASE

CORPS OF ENGINEERS, U. S. ARMY
OFFICE OF THE DIVISION ENGINEER
NEW ENGLAND DIVISION
BOSTON 7, MASS.

April 27, 1951

SUBJECT: Survey (Review of Reports) of Cranberry Island Harbor, Maine.

TO: Chief of Engineers, Department of the Army, Washington 25, D. C.

AUTHORITY

1. This report is submitted in compliance with the following resolution adopted November 8, 1948 by the Committee on Public Works of the United States Senate:

"Resolved by the Committee on Public Works of the United States Senate, That the Board of Engineers for Rivers and Harbors, created under Section 3 of the River and Harbor Act, approved June 13, 1902, be, and is hereby, requested to review the report of the Chief of Engineers on Cranberry Island Harbor, Maine, dated February 13, 1941, and prior reports, with a view to determining whether any modification of the recommendation contained therein is advisable at this time."

2. A report of survey scope was authorized by the Chief of Engineers by letter dated November 29, 1948.

REPORTS UNDER REVIEW

3. The report under review is an unpublished survey report submitted by the District Engineer July 12, 1940. This report considered dredging a channel 6 feet deep from the 6-foot depth in Cranberry Island Harbor to that depth in the Pool. Two channel widths, 75 feet and 100 feet, were considered. The report was unfavorable to dredging a channel of either width since the benefits were found to be too small and too local to warrant the expenditure of Federal funds.

DESCRIPTION

4. Cranberry Island Harbor lies between Great Cranberry and Little Cranberry Islands which are members of a group of five small islands close to the southern end of Mount Desert Island off the coast of Maine. By water, the harbor is 50 miles northeast of Rockland, 115 miles north of Portland, and about 13 miles south of Bar Harbor. Within a radius of less than 5 miles are Seal Harbor, Northeast Harbor, Southwest Harbor, and Somes Sound.

5. The harbor is partially exposed to storms from the north and northwest and particularly exposed to those from the southeast. It is well protected from other directions by Little Cranberry and Great Cranberry Islands. On the southwest side of Cranberry Island Harbor is a partially enclosed, shallow cove called the Pool which indents the east side of Great Cranberry Island. The Pool offers excellent shelter from all storms. However, it is inaccessible at low tide due to shoal water in the entrance channel which has a controlling depth of about 1.5 feet at mean low water. Within the low water line, the pool has an area of 62 acres of which only about 4 acres afford depths of 6 or more feet. Large areas at the inner end and along the sides of the cove are exposed at low water and prevent access by boat to any of the wharves. The mean range of tide is 10.3 feet and the spring range is 11.8 feet. The locality is shown on U.S. Coast and Geodetic Survey Charts numbered 306 and 1202, and on the plan accompanying this report.

TRIBUTARY AREA

6. The islands are adjacent to the summer colonies of the Mount Desert region which includes such well-known resort and yachting centers as Bar Harbor and Northeast Harbor, and the villages of Seal Harbor and Otter Creek. Southwest Harbor, located about 4 miles northwesterly of Cranberry Island Harbor, is the commercial center of the locality and handles about 75 percent of the commerce to and from the island. A first class paved highway connects Mount Desert Island with the mainland.

7. In 1940 the town of Cranberry Isles, which includes Great Cranberry, Little Cranberry and Sutton Islands, had a population of 334 and an assessed valuation of \$409,885. Preliminary census figures for 1950 show a population of 226. Proponents attribute a part of this 10-year decline in population to the lack of an adequate harbor at Great Cranberry Island. The summer population of the islands has been estimated to be about 800 people. The population of Great Cranberry Island, the island on which the improvement under consideration is located, is 134 in the winter and 208 in the summer. The principal commercial activity of the area is fishing.

BRIDGES

8. There are no bridges crossing this waterway.

PRIOR REPORTS

9. Cranberry Island Harbor has been the subject of several previous unpublished reports. Pertinent data with reference to these reports are embodied in the following tabulation:

<u>Scope and Date of Report</u>	<u>Work Considered</u>	<u>Recommendation</u>
Preliminary Examination and Survey 1936 & 1938	Considered two plans of improvement, Plan A - Entrance channel 3500 ft. long, 100 ft. wide and 6 ft. deep at mean low water. Plan B - An entrance channel 3500 ft. long, 75 ft. wide and 6 ft. deep at mean low water.	Unfavorable
Survey Report 1940	Same as previous report.	Unfavorable

EXISTING CORPS OF ENGINEERS PROJECT AND OTHER IMPROVEMENTS

10. No project for the improvement of Cranberry Island Harbor has been authorized by Congress. No improvements for navigation have been made by local interests.

TERMINAL AND TRANSFER FACILITIES

11. There are ten wharves of timber crib or pile construction situated within the Pool. All are open to the public without charge, but none is accessible at low water. Most of the wharves require considerable repair and reconstruction for their active use. Two maintained wharves have marine railway facilities of 20 to 80 ton capacity. No mechanical freight handling facilities are available or required.

12. The Town Wharf is located at Spurling Cove. This wharf is a rock-filled, timber crib structure. It is the only landing on Great Cranberry Island available for use at all tidal stages. In winter it is exposed to northerly storms and to ice floes moving south from Somes Sound. No landing stage can be maintained during this period. Town officials have stated that the Town intends to construct public landing at the Pool in the event it is improved by dredging.

13. The community of Islesford, on Little Cranberry Island, on the northeast side of Cranberry Island Harbor, is served by 3 small wharves. The local fish dealer is located at Islesford.

14. The wharves at the Cranberry Islands appear to be adequate in capacity for the present commerce on the islands, but not too satisfactory as to navigation purposes, or for future commerce. On Great Cranberry Island there is no wharf at which safe landings can be made at all tidal stages and under all weather conditions since the wharves along the shore of the protected Pool are located above the low water line and the Town Wharf in Spurling Cove is exposed during the winter months. There is sufficient area available around the Pool for the expansion and construction of terminal facilities.

IMPROVEMENT DESIRED

15. In order to give local interests an opportunity to express their views with respect to improvement of the harbor, a public hearing was held at Great Cranberry Island, Maine on August 24, 1949. The hearing was attended by representatives of local government, the fishing industry, various business interests and other interested parties.

16. At the hearing, an entrance channel and mooring basin not less than 5 feet deep were requested but no definite limits for improvement were proposed. Subsequently, Municipal officers prepared a plan of improvement which was forwarded by letter to the Division Engineer on September 10, 1949. This plan showed the desired improvement to be an entrance channel 100 feet wide and an anchorage basin of about 60 acres, both having a depth of 5 feet.

17. In view of the size of the requested anchorage, a field investigation was made on August 10 to 12, 1950 to determine the actual requirements at the harbor. As a result of discussion with local officials and fisherman, a new plan of improvement of smaller scope was developed which met the desires of all interests. It comprised 4,160 feet of main channel, 100 feet wide and 5 feet deep, extending from Cranberry Island to the relatively deep portion of the Pool, with a branch channel of the same width and depth extending 390 feet westerly from the main channel to the proposed location of the town wharf.

18. Proponents stated that the Pool constituted the only available anchorage area offering complete protection from storms but that it had little value as a harbor because of the shallow entrance channel, which had a controlling depth of water of about one foot and prevented the passage of boats during a period extending from several hours before to several hours after low water.

19. Lobstering and ground fishing are the major sources of income of many of the people living on Great Cranberry Island. Since most of the boats in the fleet are moored in the Pool at least a part of each year, fisherman are particularly handicapped by the shallow entrance channel. At low water, there is a period of about 4 hours when passage cannot be made. When low water occurs in early morning or evening, the fisherman must time their start to the fishing grounds, and their return, either increasing the length of their day or decreasing the amount of time available for fishing.

20. The majority of fisherman from Great Cranberry Island moor their boats in Spurling Cove during the summer and move them to the protected Pool in the winter. There are a few, however, who prefer to risk storm and ice damage to their boats at Spurling Cove rather than contend with the tidal delays encountered on entering and leaving the Pool, and continue to keep their boats in the exposed cove year round.

21. Proponents stated that in the event a channel is dredged into the Pool, a town wharf would be built which could be safely used under all tidal conditions. At present, the only wharf on the island usable at all tidal stages is in Spurling Cove, which is exposed to northerly storms. The wharf is hazardous to use, particularly during the winter months. Winter landings by small boats at the wharf have resulted in many near-fatal accidents. In stormy weather, the care of the sick and injured is made difficult as doctors often refuse to make the trip from Mount Desert Island, and the transfer of patients requiring hospitalization from the wharf to boats is extremely hazardous. Many old people move to Mount Desert Island for the winter months because of the hazardous landing conditions.

22. There are two boat storage yards situated on the shores of the Pool. The owners stated that the desired improvement would result in an increase in the size and number of boats stored. They stated also that, if the yards were accessible at all tides, the sales in gas, oil and other marine supplies would be increased.

23. The local fish dealer lives on Great Cranberry Island but operates his business in Islesford. He stated his intention of moving his business to Great Cranberry Island should the improvement be made. Since the fishermen from Great Cranberry Island now travel a total of 3 miles to Islesford and return to sell their catches, such a change would result in decreasing their operating costs.

24. Part of the annual income of the people living on Great Cranberry Island is derived from summer visitors. Proponents believe that the improvement would attract additional summer people to the island.

COMMERCE

25. There are no records of commerce in the Pool. The collection of commercial statistics for Cranberry Isles has been started recently. For 1949, they include the receipt of 49 tons of petroleum products and the shipment of 138 tons of seafood. No data are available to indicate the amount of general merchandise and food imported by the islanders and summer visitors. The fish dealer at Cranberry Island has stated that in 1949 there were 175 tons of lobster landed at Islesford in Cranberry Island Harbor.

VESSEL TRAFFIC

26. Detailed records of the vessel traffic in Cranberry Island Harbor are not available. One freight boat carrying mail, general merchandise and food, provides daily access to Mount Desert Island. It averages about 500 round trips annually landing at the Town Wharf in Spurling Cove. About 85 fishing boats use the harbor. These craft vary in length from 26 to 40 feet and in draft from 2.5 to 3 feet. They fish in waters up to 20 miles distant from Cranberry Island Harbor returning to sell their catches at Islesford on Little Cranberry Island. Of this fleet, 35 boats make their anchorages at Great Cranberry Island, 27 boats at Little Cranberry Island, and 23 boats in either Northeast, Seal, or Otter Creek Harbors. Ten of the 35 boats from Great Cranberry Island are used for charter during the summer and fishing during the winter. The recreational fleet based at Great Cranberry Island consists of 8 boats, comprising 4 cruisers from 33 to 50 feet in length, and drawing 2.5 to 3.5 feet of water, and 4 sailboats from 27 to 28 feet long and drawing 4 to 4.5 feet of water.

DIFFICULTIES ATTENDING NAVIGATION

27. All difficulties attending navigation arise from the shoal water in the entrance to the Pool and in front of the wharves along the shores of the Pool. Extensive delays are caused to vessels seeking to enter or leave the Pool at low water and use of the Pool is restricted. Since the Pool is the only fully protected anchorage in the immediate vicinity, this restricted use has an adverse effect upon all boats in the area.

28. Cranberry Island Harbor, adjacent to the entrance to the Pool, is exposed to storms from the southeast and partially exposed to storms from the north and northwest. Boats normally kept at Islesford on the east side of this harbor seek refuge in the Pool during storms, but can enter only when tidal conditions permit. Spurling Cove at the north end of Great Cranberry Island is exposed to northerly storms and to winter ice floes moving in from Somes Sound. This cove, however, affords the only landing at all tidal stages on Great Cranberry Island. Consequently, many Great Cranberry Island boats base in the exposed Cove, even during the winter, to avoid the tidal delays experienced from basing in the Pool. If entrance to the Pool was possible at all stages of the tide, boats would not be moored in Spurling Cove during the winter.

29. The Town Landing is maintained in Spurling Cove due to the availability of adequate water depths. Because of the exposure of the Cove, it is very difficult to transfer personnel and cargoes between boats and the wharf during storms, and particularly during the winter months. Conditions would be improved by construction of a Town Wharf in the protected Pool if landings could be made at all stages of the tide.

WATER POWER AND OTHER SPECIAL SUBJECTS

30. There are no problems involved in this investigation pertaining to water power, flood control, pollution or relative subjects. None of the contemplated work would have an adverse effect on wild life or shellfish.

PLAN OF IMPROVEMENT

31. The plan of improvement considered herein differs from that proposed by local interests in that the inner end of the main channel has been moved easterly to effect a reduction in the length of the channel and in the amount of dredging. The depth of the channels has been increased to 6 feet in lieu of the requested 5 feet to provide for more economical accomplishment of dredging operations. The project under study consists of a main channel 3,680 feet long and 100 feet wide extending from Cranberry Island Harbor to the deepened section of the Pool, and a branch channel extending westerly a distance of 430 feet to the location of the proposed Town Wharf.

32. The considered plan does not differ vitally from the desired plan, but serves to provide a more economical project. The location of the inner end of the main channel has been moved to a more easterly position so that it runs direct to instead of tangential to the existing deep basin. Relocation of the main channel required a slight increase in length of the branch channel. These changes decrease the initial cost of the project and yet provide an approach to a natural mooring basin 6 feet deep at mean low water and 4 acres in area. The natural basin will provide sufficient mooring space for 25 boats about 40 feet long and up to 6 feet in draft. Surrounding the 6-foot basin, there is an area of 8.5 acres having a minimum depth of 3 feet at mean low water. Since the

boats in the fishing fleet draw no more than 3 feet of water, this total area is adequate for the fleet and any future additions thereto. The 6-foot depth of the channel will allow its construction by equipment commonly employed on such projects.

33. The plan considered also includes the construction of a Town Wharf at the head of the branch channel and the dredging of a suitable berthing area. A timber and wood pile wharf, 220 feet long and 20 feet wide, with appurtenant floats and ladders, is considered sufficient to serve the needs of the island community. The berth would be a 100-foot extension of the branch channel and would provide docking space about 40 feet wide and 6 feet deep at mean low water across the end of the pier and for about 60 feet on each side of the pier. The construction of a public wharf available at all tidal stages is necessary to allow full utilization of the considered improvement.

AIDS TO NAVIGATION

34. The United States Coast Guard has been consulted on the matter of aids to navigation and has advised it would be necessary to erect 5 marker stakes and 2 buoys to mark the proposed improvement adequately. The Coast Guard estimates that these aids can be established at a cost of \$2000 with annual maintenance cost of \$1100.

SHORE LINE CHANGES

35. The shore of the Pool is generally composed of gravel and boulder beaches fronted by extensive flats. There are a few scattered ledge out-croppings. Adjacent to the easterly side of the proposed channel, near the entrance cove, is a spit of coarse gravel and boulders.

The proposed channel might cause a slight change in the end of the spit, but would not create conditions which would affect the remainder of the shoreline. Dredging within the cove would have no effect upon shorelines outside of the cove.

ESTIMATES OF FIRST COST

36. Quantities estimated for dredging are for materials measured in place with an allowance for one foot of overdepth dredging. The unit price for dredging is estimated for the material being removed by dipper dredge and dumped at sea. This price reflects costs prevailing in March 1951 for the type of work involved and includes an allowance for contingencies, engineering, inspection and overhead. The cost of aids to navigation is based upon information furnished by the United States Coast Guard. The estimate of first cost of the improvement is as follows:

a. Construction.

(1) Dredging Entrance Channel to the Pool.

6 feet deep at M.L.W. and 100 feet wide.
Approximately 68,000 cubic yards of mud,
sand, gravel, stones and clay at \$1.75.....\$119,000

(2) Dredging Branch Channel to Town Wharf.

6 feet deep at M.L.W. and 100 feet wide.
Approximately 20,000 cubic yards of mud,
sand, clay, stones and gravel at \$1.75..... 35,000

TOTAL COST OF CHANNELS.....\$154,000

(3) Dredging Berth

6 feet deep at M.L.W.
Approximately 8,000 cubic yards of mud,
sand, clay, stones and gravel at \$1.75..... 14,000

TOTAL COST OF DREDGING.....\$168,000

(4) Town Wharf

Constructing wood pile and timber pier,
220 feet long and 20 feet wide, with
appurtenant float.....\$ 17,000

TOTAL CONSTRUCTION COST.....\$185,000

b. Aids to Navigation.

Establishing buoys and markers..... 2,000

c. TOTAL ESTIMATED PROJECT COST.....\$187,000

ESTIMATES OF ANNUAL CHARGES

37. The estimated annual charges have been computed on an assumed life of 50 years for the improvement, and on the basis that local interests will erect and maintain a public wharf and provide adequate berthing areas. The total annual charges also include the replacement of the wharf once during the lifetime of the project. Interest and amortization were figured using an interest rate of 3 percent on the Federal investment, and 3.5 percent on the non-Federal investment.

INVESTMENT

Federal Investment

Construction Cost, Corps of Engineers.....\$154,000

Aids to Navigation, U.S. Coast Guard..... 2,000

TOTAL FEDERAL INVESTMENT.....\$156,000

Non-Federal Investment

Dredging berth.....\$ 14,000

Town Wharf..... 17,000

*Sinking fund to replace wharf in 25 years..... 7,000

TOTAL NON-FEDERAL INVESTMENT..... 38,000

TOTAL INVESTMENT.....\$194,000

* The investment required at 3.5 percent to provide \$17,000 in 25 years for replacement of structure.

ESTIMATED ANNUAL CHARGES

Federal Annual Carrying Charge

Corps of Engineers

Interest on Investment.....	\$4,600
Amortization of Investment.....	1,400
Maintenance.....	<u>3,000</u>
TOTAL.....	\$ 9,000

United States Coast Guard

Interest on Investment.....	60
Amortization of Investment.....	20
Maintenance.....	<u>1,100</u>
TOTAL.....	<u>1,180</u>

TOTAL FEDERAL ANNUAL CARRYING CHARGES.....\$10,180

Non-Federal Annual Carrying Charges

Interest on Investment.....	\$1,300
Amortization of Investment.....	300
Maintenance.....	<u>500</u>
TOTAL NON-FEDERAL ANNUAL CARRYING CHARGES.....	<u>2,100</u>

TOTAL ANNUAL CARRYING CHARGES.....\$12,280

ESTIMATES OF BENEFITS

38. The plan of improvement was designed to provide an entrance channel to a safe, year-round anchorage which could be used by boats based at Great Cranberry Island. It would also provide a harbor of refuge for other boats frequenting adjacent waters, and particularly the boats which now moor in exposed locations at Little Cranberry Island and have to seek shelter during severe northerly storms. The principal benefits to be derived from the proposed improvement will result from a decrease in the daily operational costs of many of the fishermen and from a reduction in storm damage to boats.

39. The boats which will be affected by the improvement of the Pool are those of the fishermen who live on Great Cranberry Island and those of the fishermen from other harbors who sell their catches at Islesford in Cranberry Island Harbor. The home ports of the boats selling their catches at Islesford are listed below. It is to be noted that during the summer 25 of the 35 boats from Great Cranberry Island are moored in Spurling Cove while during the winter only 10 of the boats remain in that Cove. Ten of the boats based in Spurling Cove during the summer operate as charter boats. In the winter, these ten boats are used for fishing.

BOATS SELLING CATCHES AT ISLESFORD

Home Port	Number of Boats	
	Summer	Winter
Pool - Great Cranberry Island	10	25
Spurling Cove - Great Cranberry Island	15*	10
Islesford - Little Cranberry Island	27	27
Mt. Desert Island Harbors - Northeast, Seal and Otter Creek	23	23

* 10 other boats operate for charter.

40. The boats moored at Spurling Cove during the winter are exposed to damage from both northerly storms and ice floes moving out of Somes Sound. Nevertheless, some fishermen prefer to risk such damage rather than suffer the tidal delays now encountered in the Pool and, therefore, base their boats in the Cove the year round. If the Pool was improved, local fishermen have stated that no boats would base in Spurling Cove but all would be moored in the Pool. It was claimed at the hearing that five fishing boats moored in Spurling Cove had suffered damage amounting to \$150 to \$350 per boat during the winters 1947 through 1949. At an average of \$250 per boat, the total damage for the period was \$1,250. A further investigation disclosed that in the winters of 1940 through

1944, five other boats had suffered damage amounting to a total of \$2,900. The total boat damage for the 10-year period, 1940 through 1949, was \$4,150 or about \$400 per year. The improvement of the Pool to allow all boats to anchor there will result in a general benefit of \$400 per year through the elimination of vessel damage.

41. The fish dealer at Islesford has indicated that he would move his business to Great Cranberry Island where he lives, should the desired improvement be made. Fishermen from this island have estimated that such a move would result in a saving to them in daily operational time of about 0.5 of an hour in going to Islesford to sell their catch. However, these fishermen from Islesford and other parts would be adversely affected by such a move, since they would travel an additional distance to the Pool to sell their catches. It is considered that no benefit will accrue to the fishing fleet as a whole in the event the dealer at Islesford relocates his business to a site within the environs of the Pool.

42. Fishing boats using the Pool draw between 2.5 and 3.0 feet. Because of the shallow entrance channel, these boats experience delays varying up to 4 hours in entering and leaving the Pool. Such tidal delays affect operations since times of departure and return must be varied with the state of the tide. Under the most adverse conditions when low water occurs during early morning and late afternoon of the same day, the fishermen must increase or decrease the length of their work day. Great Cranberry Island fishermen have stated that their average daily lobster catch is 100 pounds and that their average day is about 12 hours, which is a longer day than reported by lobstermen making similar catches from harbors in which there is no tidal delay. Evidently, the length of the work day is more frequently increased than decreased to meet tidal conditions, and consequently the boats are in operation for a greater period of time than actually required to haul the traps. It is considered that a fisherman,

establishing himself in a harbor at which there are tidal delays, should expect to vary the times of his departures and arrivals by at least 2 hours to meet tidal conditions. An analysis of the times of low water, with respect to the desirable times of departure and return, indicates that a fisherman varying such times by 2 hours would still have to increase the length of his day under the most adverse tidal conditions to put in a full day of fishing. This increase varies up to 2 hours and averages one-half hour per day. The elimination of tidal delays would thus reduce the operation period of the boats by one-half hour per day and increase the net value of the catch by an amount equal to the savings in boat operation.

43. Fishermen from Great Cranberry Island haul their lobster traps 4 days per week throughout the year. The average hourly operating cost of their boats is \$2.25. Ten of these boats are based in the Pool 52 weeks per year, and 15 are based there only during the winter for a 22-week period. A reduction of one-half hour in the operation of these boats on each trip would result in an annual savings of \$2,340 for the boats based full time in the Pool and \$1,485 for the boats based there only during the winter. This savings, totaling \$3,825, would increase the net value of the lobster catch by an equal amount, and is considered to be a general benefit. The net value of the catch is defined as the market value of the fish to the fishermen less his catching and marketing costs.

44. It does not appear that the development of an entrance channel to the Pool at Great Cranberry Island would influence appreciably the growth of the present recreational or fishing fleets. Proponents have stated that within the last 10 years, ten fishermen have moved from Great Cranberry Island because there was no adequate harbor. However, no evidence was submitted that any of these would return. It is considered doubtful that any man who has established himself in a satisfactory harbor would return to Great Cranberry Island because the Pool was improved.

45. The recreational fleet of 8 boats is moored in Spurling Cove, which has adequate space for many additional craft. These boats are used about 3 months during the summer and are stored in boatyards in the Pool during the winter. It would appear that Spurling Cove is a reasonably safe summer anchorage as no damages have been reported by pleasure craft. As the majority of summer homes are situated near Spurling Cove, it is reasonable to assume that any increase in the fleet would result in increased use of the Cove. Therefore, it is considered that improvement of the Pool would have no measurable effect on the recreational fleet. Hence, no benefit is assigned to recreational boating.

46. At the time of the hearing, representatives of the two boatyards located within the limits of the Pool stated that the improvement would be of material benefit to them. Their statements were based upon deep water being brought to their wharves and railways. They estimated that the yards would be able to compete with other boatyards in the region as they could accommodate an increased number of larger craft. The plan of improvement under consideration does not include dredging access channels to the private boatyards, and they will benefit only incidentally unless they provide approach channels or increase the length of their piers. Such work is improbable due to its large cost. Thus, potential benefits are doubtful of realization and have not been evaluated.

47. Proponents for the improvement anticipate that it would increase the summer tourist business on Great Cranberry Island. Since the summer activity is centered around Spurling Cove and the recreation fleet will continue to base there, it is considered that improvement of the Pool would have no appreciable effect upon the tourist business.

48. Although the improvement will benefit primarily the local fleet of fishing boats, it will nevertheless serve as a harbor of refuge for small recreational or commercial boats operating within the vicinity of Cranberry Island Harbor or based in more exposed harbors on the islands. By providing such a haven, potential storm losses to these boats would be minimized. The benefits would be somewhat localized since the islands are adjacent to other protected harbors. The provision of a safe harbor in which landings could be made under all tidal conditions would be of great value to inhabitants on Great Cranberry Island and would eliminate the danger now experienced in making landings at Spurling Cove. Benefits derived from the provision of a place of refuge and safe landing are real though difficult of monetary evaluation. It is believed that the benefits would not exceed \$500 annually.

49. The total evaluated benefits are general in character and are summarized as follows:

Elimination of Boat Damage to Fishing Vessels.....	\$ 400
Elimination of Tidal Delays to Commercial Fishing Vessels.	3,825
Benefits through use as Harbor of Refuge.....	<u>500</u>
Total General Benefits.....	\$4,725

COMPARISON OF BENEFITS AND COSTS

50. The estimated annual benefits, evaluated at \$4,725, and the estimated annual carrying charges of \$12,280 result in a ratio of benefits to costs of 0.4 to 1.0.

ALLOCATION OF COSTS AND LOCAL COOPERATION

51. In the absence of a favorable benefit-cost ratio, no allocation of costs or conditions for local cooperation are prescribed herein. Town officials have stated that the Town would be unable to make any cash contribution to the project, but would agree to establish a public wharf adjacent to the Pool.

COORDINATION WITH OTHER AGENCIES

52. All Federal, state, and local agencies having interests in the development and use of the waterway were notified of the hearing held August 24, 1949 to obtain the views of local interests concerning the improvements desired. The desired plan of improvement was reviewed with local interests in August 1950 to determine the extent of an improvement which would reasonably meet the need of the area. Subsequent discussions were held with local officials and local interests concerning the desired improvements and the results of this survey.

DISCUSSION

53. Cranberry Island Harbor is located between Great Cranberry and Little Cranberry Islands, two of a group of five islands which are incorporated as the Town of Cranberry Isles. These islands lie close to the southerly end of Mount Desert Island off the coast of Maine. The source of income of the residents of Great Cranberry and Little Cranberry Islands is derived from fishing and catering to summer vacationists.

54. The Pool is a cove which lies on the westerly side of Cranberry Island Harbor and indents the shore of Great Cranberry Island. It is protected from storms from all quarters. Local interests desire improvement of the Pool which has an area, mostly shallow, of about 62 acres at mean low tide. However, there is a natural deep water area of about 12.5 acres which has a minimum depth of 3 feet and of which about 4 acres have depths of 6 or more feet at low water. The entrance channel from the main harbor to this basin is shallow and boats commonly in use in the area can navigate it only during high tidal stages.

55. A fleet of 85 lobster boats sell their catch to a dealer at Islesford in Cranberry Island Harbor. Of this fleet, 27 boats are Little Cranberry Island boats based at Islesford and 35 boats are Great Cranberry Island boats based in the Pool and in Spurling Cove at the north end of the islands. The remaining 23 boats are based in nearby harbors on Mount Desert Island. The number of boats based in the Pool varies from 10 during the summer to 25 in the winter. A small fleet of recreational boats is based in Spurling Cove during the summer and stored at boatyards in the Pool during the winter.

56. In order to avoid tidal delays, most of the fishermen moor their boats in Spurling Cove during the summer. This cove is unprotected from the north, but it has adequate water depths at low tide and is generally considered a satisfactory summer anchorage when northerly storms are infrequent. However, in the winter months, northerly storms are prevalent and ice floes from Somes Sound move into the Cove. These conditions have resulted in damage to boats moored there. A few fishermen risk this damage during the winter but most of them move their boats to the Pool.

57. Inadequate landing facilities during the winter creates another problem for the inhabitants of Great Cranberry Island. The Town Landing in Spurling Cove has adequate water depths, and small boats with a draft not exceeding 4 feet can dock there even at low tide. However, the exposure of the cove makes landings difficult during storms. In the winter, no floats can be maintained at the wharf. Passengers must use ladders and life lines getting from boats to the wharf, a difficult, dangerous process. On the other hand, wharves within the Pool lie relatively safe and protected from storms or severe winds but are unapproachable at less than half-tide by the ordinary small boats operating in the vicinity.

58. The considered plan of improvement is based upon the needs of the boats using, or expected to use, the Pool. The Pool is used principally by fishing boats which are about 40 feet in length and draw about 3 feet. The plan of improvement would provide for their entrance to the anchorage area and access to landing facilities at all tidal stages, thus eliminating all tidal delays now encountered. Present use of the Pool by recreational boats is relatively unimportant. These boats generally use the Pool only for passage to and from the boatyards where they are hauled out for the winter. During the boating season, pleasure boats basing at Great Cranberry Island are kept in Spurling Cove and would base there after improvement of the Pool. The plan of improvement would provide safe landing facilities under all weather and tidal conditions, a type of facility not presently available on Great Cranberry Island.

59. The plan of improvement as originally requested by local interests was too extensive for the needs of the harbor. It was modified in order to reduce the first cost of construction. The proposed plan consists of a main channel 6 feet deep and 100 feet wide which extends from Cranberry Island Harbor to the deep water section of the Pool and a branch channel of equal width and depth to a proposed town wharf. The channel dimensions are considered adequate for all vessels which would use the Pool. Adjacent to the main channel is an area of about 12.5 acres which has a minimum depth at mean low water of 3 feet. This area is considered sufficient for the anchorage of all the fishing boats associated with Great Cranberry Island and any other boats which might seek refuge in the cove. The plan also includes the construction of a town wharf 220 feet long and 20 feet wide with berthing area 6 feet deep at its outer end. It is considered that such a wharf would adequately serve the needs of the community.

60. The fishing boats from Great Cranberry Island would derive the greatest benefits from the improvement. They would have a protected harbor from which they could operate, safe from storm damage and free from tidal delays. At present, the boats, based at Spurling Cove during the winter to avoid tidal delays in the Pool, suffer storm damage, averaging \$400 per year, which would be eliminated by transferring to the Pool. The boats moored in the Pool are affected by tidal conditions which result in added operating costs amounting to \$3,825 annually. The completed improvement would result in a total annual saving of \$4,225 in storm damages and boat operations to the boats from this island. This saving is considered to be a general benefit since it increases the net value of the lobster catch. However, relatively few benefits would accrue to the remaining 50 of the 85 boats which either base or sell their catches in Cranberry Island Harbor. These latter boats would benefit only to the extent that they would have a refuge in the Pool. The value of the improvement as a harbor of refuge is estimated at \$500 annually. Since the fish dealer at Islesford intends to move to Great Cranberry Island if the Pool is improved, the improvement might in reality have an adverse effect on boats from Islesford and other harbors since it would necessitate their travelling farther to sell ~~their~~ catches and thus increase their costs of operation.

61. There are two boatyards located on the shores of the Pool which are engaged principally in the storage of pleasure craft from Great Cranberry and neighboring islands. As added justification for the improvement, local interests asserted that the business of these yards would be increased appreciably. This claim was based on the plan originally proposed by local interests, which included an area of 62 acres, to remove the extensive flats and bring deep water to the shores of the yards. The plan of improvement as developed in subsequent conference with local interests and considered herein does not include such extensive dredging.

In order to derive the benefit from the considered improvement, approach channels to the yards would be required. It is not the policy of the Federal Government to provide approach channels to private wharves. It is doubtful if the expected business would justify the cost of this dredging and it is questionable whether the owners would undertake the work privately. In view of the uncertainty of extensive private dredging, no benefits have been evaluated.

62. It appears unlikely that the growth of the recreational fleet at Great Cranberry Island will be influenced greatly by any development in the Pool. These boats have an adequate summer mooring at Spurling Cove and very likely will remain there. The Pool would serve as a refuge for these boats and the other small pleasure or commercial boats in the vicinity, but there are other refuges nearby, such as Northeast Harbor, Southwest Harbor, and Somes Sound. The establishment of an additional refuge at Great Cranberry Island would provide only the minor benefits to general navigation hereinbefore discussed, due to the proximity of these latter havens which are natural harbors affording greater facilities and direct connection with the mainland.

63. The benefits to be derived from the improvement considered herein are general in character. The estimated annual benefits evaluated at \$4,725 and the estimated annual carrying charges of \$12,280 result in a ratio of benefits to costs of 0.4 to 1.0 which indicates that the project is not justified.

CONCLUSIONS

64. The improvement of the Pool by dredging a channel 6 feet deep and 100 feet wide between the entrance and deep water within the Pool, and a similar branch channel to a proposed town wharf can be accomplished at a cost of \$154,000 for channel dredging, \$2,000 for aids to navigation,

and \$31,000 for wharf and berth construction, or a total cost of \$187,000. The construction of the wharf and berth would be a local responsibility. This improvement would provide an anchorage and landing place for Great Cranberry Island which would be available for use under all tidal and weather conditions.

65. The principal benefit would accrue to the fishermen living on Great Cranberry Island who would benefit through the elimination of vessel damage and reduction of operating costs of their vessels. All residents of Great Cranberry Island would benefit through provision of a safe landing. Minor unevaluated benefits would accrue to pleasure craft as they use the Pool only for access to yards where they are hauled out for winter storage. The Pool would be a place of refuge during storms for boats based on Great and Little Cranberry Islands or caught in adjacent waters. The presence of other harbors on adjacent Mount Desert Island with direct access to the mainland precludes any urgent need for a harbor of refuge for general navigation in the area.

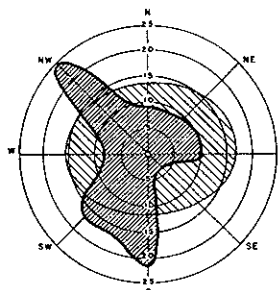
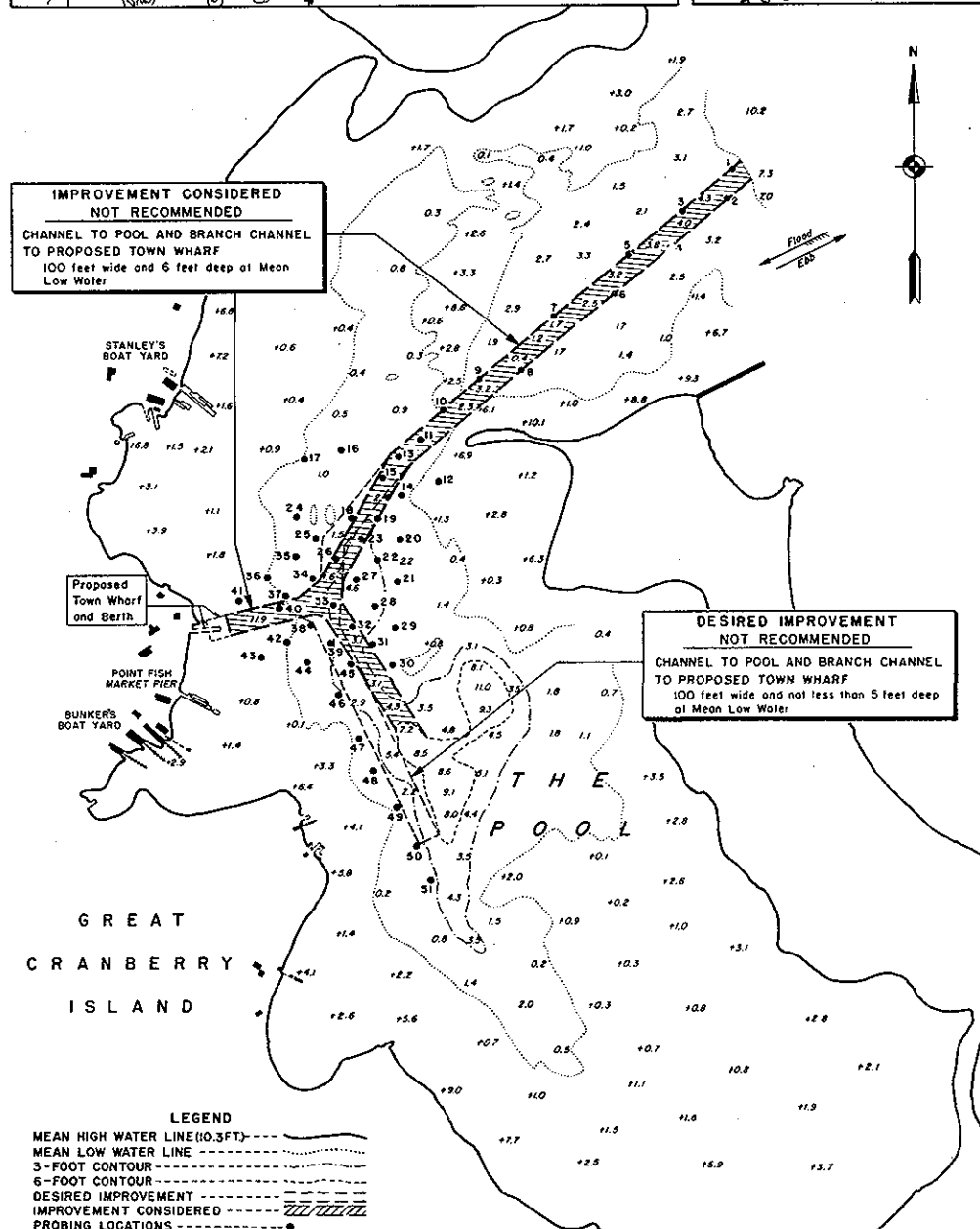
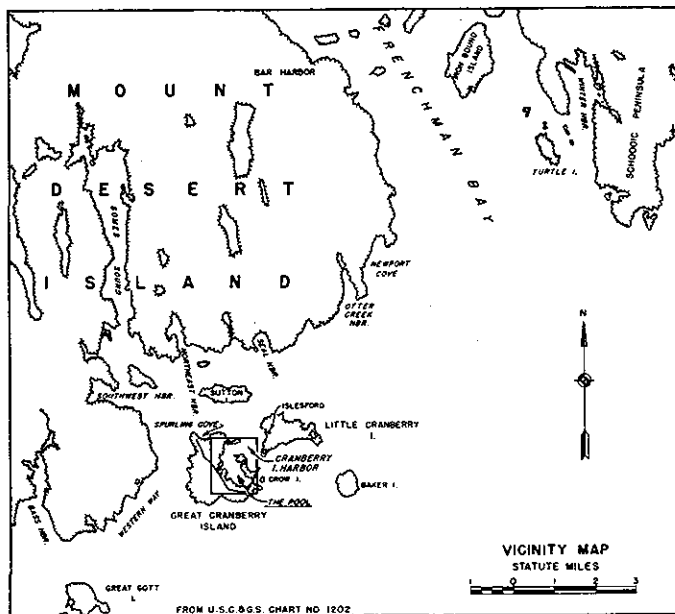
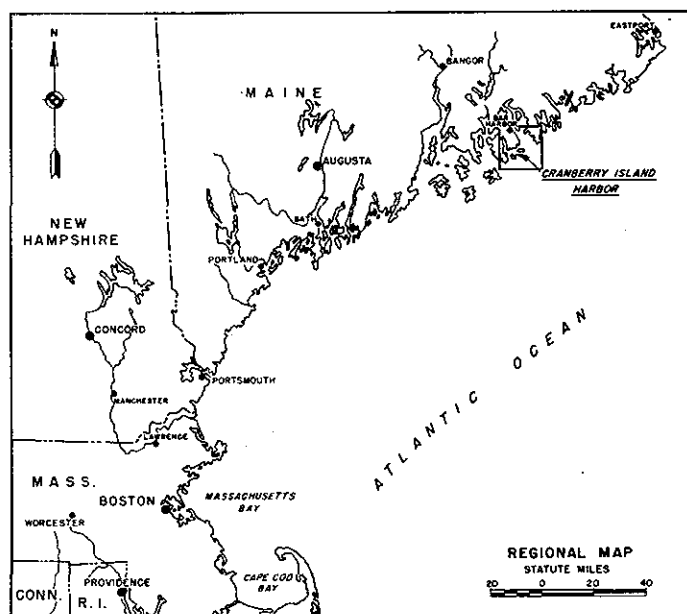
66. The benefit-cost ratio of 0.4 to 1.0 indicates that the project is not economically justified. The unevaluated intangible benefits pertaining to the development of an all-weather landing on the island, and convenient access to the boatyards are not considered to be sufficient to make the benefit-cost ratio favorable. Therefore, the improvement of the Pool at this time is not warranted.

RECOMMENDATIONS

67. The Division Engineer recommends that no project for the improvement of Cranberry Island Harbor, Maine, be adopted at this time by the Federal Government.

H. J. WOODBURY
Colonel, Corps of Engineers
Division Engineer

1 Incl:
Plan of Improvement



NUMBER	DATE	DEPTH WATER	DEPTH PROBE	MATERIAL
1	1937	5.0	7.3	Sand & Gravel
2	"	4.0	7.6	"
3	"	3.9	7.4	"
4	"	3.9	7.9	"
5	"	3.3	7.3	"
6	"	2.5	7.6	Gravel
7	"	1.8	7.3	"
8	"	0.4	7.7	Gravel, Clay
9	"	2.3	7.4	Gravel & Stones
10	"	0.4	7.2	Mud, Sand, & Gravel To Clay
11	1949	1.7	7.2	Mud, Sand, & Clay, 3.0 Clay
12	"	+1.6	7.8	Sand
13	1937	1.5	7.4	Sand & Gravel To Clay
14	1949	1.4	7.4	Stones, Mud & Sand
15	1937	2.1	7.7	Mud, Sand, & Gravel To Clay
16	1949	0.0	7.4	Mud, Sand & Clay
17	"	+1.0	7.1	Sand, Mud
18	1937	3.0	7.7	Mud & Sand To Clay
19	"	2.6	7.8	"
20	"	2.1	8.0	Sand & Gravel To Clay
21	"	2.7	7.4	"
22	"	3.0	7.9	"
23	"	3.3	8.2	Gravel To Clay
24	1949	+0.2	8.2	Stones, Mud, Clay
25	1937	0.9	8.0	Mud & Sand To Clay
26	"	2.5	8.5	Gravel To Clay
27	"	4.4	8.2	Mud, Sand & Gravel To Clay
28	"	3.3	7.6	Sand & Gravel To Clay
29	"	2.2	7.6	"
30	"	0.9	7.3	Mud, Sand, Gravel To Clay
31	"	2.6	8.2	Sand & Gravel To Clay
32	"	4.8	7.6	"
33	"	4.0	8.1	Mud & Gravel To Clay
34	"	0.4	8.6	Sand To Clay
35	1949	+0.4	6.9	Stones, Clay, Mud, Clay
36	"	+0.5	6.8	Mud, Clay, Shingles
37	"	0.0	7.3	Clay & Stones
38	1937	1.1	7.8	Gravel To Clay
39	"	3.3	8.8	Mud & Gravel, Sand To Clay
40	1949	+1.2	8.0	Clay & Stones
41	"	1.2	7.0	"
42	"	0.0	7.3	"
43	"	+0.8	7.4	Sand, Mud
44	1937	1.2	7.1	Gravel To Clay
45	"	3.6	7.9	Mud, Sand & Gravel To Clay
46	1949	2.3	7.2	Gravel & Clay
47	"	0.8	7.4	Stones, Gravel
48	"	1.3	8.7	Sand, Mud & Stones
49	"	0.4	8.4	Stones & Clay
50	"	2.0	8.9	Sand, Mud
51	"	2.2	9.0	Gravel, Mud To Clay

* Probing data from survey of 1937 as shown on Map File No. 1159 D-11-1 and survey of 1949 as shown on Map File No. 874 D-11-1, but are given new key numbers. These maps are not published.

CRANBERRY ISLAND HARBOR, MAINE

IN 1 SHEET SCALE IN FEET
200 0 200 400 600 800 1000

NEW ENGLAND DIVISION, BOSTON, MASS. MARCH 2, 1951

APPROVED: *[Signature]* COL. C. E. DUNN, DISTRICT ENGINEER

SUBMITTED: *[Signature]* TO ACCOMPANY SURVEY REPORT DATED: APRIL 27, 1951

FILE NO. 1188 D-11-1